

What is claimed is:

1. A method of managing defects on a write-once optical recording medium having at least one recording layer, the method comprising the steps of:

allocating at least one temporary defect management area having a fixed size and at least one temporary defect management area having a variable size to the optical recording medium, respectively; and

recording defect management information on the at least one temporary defect management area having a fixed size and/or the at least one temporary defect management area having a variable size.

2. The method of managing of claim 1, wherein in the step of allocating, the optical recording medium has at least two recording layers, a first recording layer which includes a temporary defect management area having a fixed size and a temporary defect management area having a variable size, and a second recording layer which includes a temporary defect management area having a fixed size and at least two temporary defect management areas having a variable size.

3. The method of managing of claim 1, wherein in the allocating step, the at least one temporary defect management area having a fixed size is allocated to at least one of a lead-in area and a lead-out area of the optical recording medium.

4. The method of managing of claim 3, wherein in the allocating step, the at least one temporary defect management area having a variable size is allocated to at least one spare of the optical recording medium.

5. The method of managing of claim 4, wherein the at least one spare area includes an inner spare area and an outer spare area on the optical recording medium.

6. The method of managing of claim 1, wherein the step of allocating further comprises:

allocating at least one inner spare area, a portion of which is used to replace a defective area;

allocating at least one outer spare area, a portion of which is used to replace a defective area; and

allocating a portion of the at least one outer or inner spare area as a temporary defect management area to manage defect management information.

7. The method of managing of claim 1, wherein in the step of allocating, the at least one temporary defect management area is allocated to a first outer spare area on the optical recording medium and has a size variable depending on a size of the entire first outer spare area.

8. The method of managing of claim 1, wherein in the step of allocating, the optical recording medium has at least two recording layers, a first recording layer which includes a first inner spare area, an entire area of which is used to replace a defective area and a first outer spare area having a variably allocated size, and a second recording layer which includes a second inner spare area and a second outer spare area.

9. The method of managing of claim 4, wherein in the step of allocating, if the at least one spare area is not allocated, the at least one temporary defect management area having a variable size is not allocated, but only the at least one temporary defect management area having a fixed size is allocated.

10. The method of managing of claim 4, wherein in the step of allocating, if the at least one spare area is allocated, the at least one temporary defect management area having a variable size is not allocated, but only the at least one temporary defect management area having a fixed size is allocated.

11. The method of managing of claim 1, wherein the optical recording medium is a write-once blu-ray disc (BD-WO).

12. The method of managing of claim 1, wherein in the step of recording, said defect management information includes at least one temporary defect list (TDFL) and at least one temporary disc definition structure (TDDS).
13. The method of managing of claim 12, wherein the size of the at least one temporary disc definition structure is fixed, and the size of the at least one temporary defect list is variable.
14. The method of managing of claim 12, wherein the at least one temporary defect list and the at least one temporary disc definition structure are separated.
15. The method of managing of claim 12, wherein the at least one temporary defect list and the at least one temporary disc definition structure are integrated.
16. The method of managing of claim 1, wherein in the step of recording, the at least one temporary defect management area having a fixed size and the at least one temporary defect management areas having a variable size are used sequentially to record therein the defect management information.

17. The method of managing of claim 1, wherein in the step of recording, the at least one temporary defect management area having a fixed size and the at least one temporary defect management area having a variable size are used randomly without a predetermined order to record therein the defect management information.
18. The method of managing of claim 1, wherein in the step of recording, the at least one temporary defect management area having a fixed size and the at least one temporary defect management area having a variable size are used in an order depending on the significance given to the defect management information.
19. The method of managing of claim 1, wherein in the step of recording, the at least one temporary defect management area having a fixed size and the at least one temporary defect management area having a variable size are used in an order which depends on a number of defective areas present on the optical recording medium.
20. The method of managing of claim 1, wherein in the step of recording, the defect management information is recorded on the at least one temporary defect management area having a fixed size and the at least one temporary defect management area having a variable size depending on a time duration between a previous defect management

information update time and a current defect management information update time.

21. The method of managing of claim 20, wherein if the time duration between the previous update time and the current update time exceeds a reference time duration, the defect management information is recorded on the at least one temporary defect management area having a fixed size.

22. The method managing of claim 1, wherein in the step of recording, the defect management information is recorded on the at least one temporary defect management area having a variable size when using the optical recording medium and on the at least one temporary defect management area having a fixed size when ejecting the optical recording medium.

23. The method of managing of claim 1, wherein, if a defective area is created when recording data, the data to be recorded is recorded on a predetermined area for linear replacement, and in the recording step, the defect management information pertaining to the defective area is recorded randomly in either the at least one temporary defect management area having a fixed size or the at least one temporary defect management area having a variable size depending on which temporary defect management area is nearest to the created defective area.

24. The method of managing of claim 1, wherein the at least one temporary defect management area having a variable size is accessed first at an initial time of loading the optical recording medium.

25. The method of managing of claim 1, wherein in the recording step, the defect management information includes full indication information providing notification of which area among the temporary defect management areas is full.

26. The method of managing of claim 1, further comprising: recording defect management information on a permanent defect management area of the optical recording medium when the optical recording medium is to be finalized.

27. The method of managing of claim 1, further comprising: recording defect management information in a permanent management area of the optical recording medium when a spare area of the optical recording medium is full.

28. The method of managing of claim 1, further comprising: recording defect management information on a permanent management area of the optical recording medium when the temporary

defect management areas are full and defects cannot be managed any longer.

29. An apparatus for managing defects on a write-once optical recording medium, the apparatus comprising:

means for allocating at least one temporary defect management area having a fixed size and at least one temporary defect management area having a variable size to the optical recording medium, respectively; and

means for recording defect management information on the at least one temporary defect management area having a fixed size and/or the at least one temporary defect management area having a variable size.

30. A write-once optical recording medium having at least one recording layer, comprising at least one temporary defect management area having a fixed size and at least one temporary defect management area having a variable size, wherein defect management information is recorded on the at least one temporary defect management area having a fixed size and/or the at least one temporary defect management area having a variable size.

31. The optical recording medium of claim 30, wherein the optical recording medium comprises at least two recording layers, including:

a first recording layer, which includes a temporary defect management area having a fixed size and a temporary defect management area having a variable size; and

a second recording layer which includes a temporary defect management area having a fixed size and at least two temporary defect management areas having a variable size.

32. The optical recording medium of claim 30, wherein the at least one temporary defect management area having a fixed size is located in at least one of a lead-in area and a lead-out area of the optical recording medium.

33. The optical recording medium of claim 32, wherein the at least one temporary defect management area having a variable size is located in at least one spare area of the optical recording medium.

34. The optical recording medium of claim 33, wherein the at least one spare area includes an inner spare area and an outer spare area on the optical recording medium.

35. The optical recording medium of claim 30, further comprising:

at least one inner spare area, a portion of which is used to replace a defective area; and

at least one outer spare area, a portion of which is used to replace a defective area,

wherein a portion of the at least one outer or inner spare area is used as a temporary defect management area to manage defect management information.

36. The optical recording medium of claim 30, wherein the at least one temporary defect management area having a variable size is located in a first outer spare area on the optical recording medium and has a size variable depending on a size of the entire first outer spare area.

37. The optical recording medium of claim 30, wherein said optical recording medium has at least two recording layers, said at least two recording layers comprising:

a first recording layer which includes a first inner spare area, an entire area of which is used to replace a defective area and a first outer spare area having a variably allocated size; and

a second recording layer which includes a second inner spare area and a second outer spare area.

38. The optical recording medium of claim 30, wherein the optical recording medium is a write-once blu-ray disc (BD-WO).

39. The optical recording medium of claim 30, wherein said defect management information includes at least one temporary defect list (TDFL) and at least one temporary disc definition structure (TDDS).

40. The optical recording medium of claim 39, wherein the size of the at least one temporary disc definition structure is fixed, and the size of the at least one temporary defect list is variable.

41. The optical recording medium of claim 39, wherein the at least one temporary defect list and the at least one temporary disc definition structure are separated.

42. The optical recording medium of claim 39, wherein the at least one temporary defect list and the at least one temporary disc definition structure are integrated.

43. The optical recording medium of claim 30, wherein the at least one temporary defect management area having a fixed size and the at least one temporary defect management areas having a variable size are used sequentially to record therein the defect management information.

44. The optical recording medium of claim 30, wherein the least one temporary defect management area having a fixed size and the at

least one temporary defect management area having a variable size are used randomly without a predetermined order to record therein the defect management information.

45. The optical recording medium of claim 30, wherein the at least one temporary defect management area having a fixed size and the at least one temporary defect management area having a variable size are used in an order depending on the significance given to the defect management information.

46. The optical recording medium of claim 30, wherein the at least one temporary defect management area having a fixed size and the at least one temporary defect management area having a variable size are used in an order which depends on a number of defective areas present on the optical recording medium.

47. The optical recording medium of claim 30, wherein the defect management information is recorded on the at least one temporary defect management area having a fixed size and the at least one temporary defect management area having a variable size depending on a time duration between a previous defect management information update time and a current defect management information update time.

48. The optical recording medium of claim 47, wherein if the time duration between the previous update time and the current update time exceeds a reference time duration, the defect management information is recorded on the at least one temporary defect management area having a fixed size.

49. The optical recording medium of claim 30, wherein the defect management information is recorded on the at least one temporary defect management area having a variable size when using the optical recording medium and on the at least one temporary defect management area having a fixed size when ejecting the optical recording medium.

50. The optical recording medium of claim 30, wherein, if a defective area is created when recording data, the data to be recorded is recorded on a predetermined area for linear replacement, and in the recording step, the defect management information pertaining to the defective area is recorded randomly in either the at least one temporary defect management area having a fixed size or the at least one temporary defect management area having a variable size depending on which temporary defect management area is nearest to the created defective area.

51. The optical recording medium of claim 30, wherein the at least one temporary defect management area having a variable size is accessed first at an initial time of loading the optical recording medium.

52. The optical recording medium of claim 30, wherein the defect management information includes full indication information providing notification of which area among the temporary defect management areas is full.

53. The optical recording medium of claim 30, further comprising:

a permanent management area to record therein defect management information when the optical recording medium is to be finalized.

54. The optical recording medium of claim 30, further comprising:

a permanent management area to record therein defect management information when a spare area of the optical recording medium is full.

55. The optical recording medium of claim 30, further comprising:

a permanent management area to record therein defect management information when the temporary defect management areas are full and defects cannot be managed any longer.